CLAIMS

What is claimed is:

1. An ultrasonic medical device comprising:

an ultrasonic probe having a proximal end, a distal end and a longitudinal axis therebetween; and

a flexible material engaging the ultrasonic probe,

wherein the portion of the longitudinal axis of the ultrasonic probe with the flexible material protects a vasculature as the ultrasonic probe is moved through the vasculature.

2. The device of claim 1 wherein the portion of the longitudinal axis of the ultrasonic probe with the flexible material is shaped to increase a radial span of the ultrasonic medical device.

3. The device of claim 1 wherein the flexible material surrounds the distal end of the ultrasonic probe.

4. The device of claim 1 wherein the portion of the longitudinal axis of the ultrasonic probe with the flexible material is curved.

5. The device of claim 1 wherein the flexible material cushions a tip of the ultrasonic probe as the ultrasonic probe is moved through the vasculature.

6. The device of claim 1 wherein the flexible material facilitates navigation of the ultrasonic medical device within the vasculature.

7. The device of claim 1 wherein the flexible material reduces the stresses on the ultrasonic probe as the ultrasonic probe is navigated within the vasculature.

8. The device of claim 1 wherein the flexible material comprises a material of high radiopacity.

9. The device of claim 8 wherein the material of high radiopacity is tungsten.

10. The device of claim 1 wherein the flexible material comprises a polymer material.

11. The device of claim 1 wherein the ultrasonic probe is a wire.

12. The device of claim 1 wherein the flexible material is more flexible than the ultrasonic probe.

13. The device of claim 1 wherein the distal end of the ultrasonic probe is thinner than the proximal end of the ultrasonic probe.

14. The device of claim 1 wherein the flexible material is melt formed to the ultrasonic probe.

15. The device of claim 1 wherein a layer of shrink fitting is applied to the flexible material and the ultrasonic probe.

16. The device of claim 1 wherein the flexible material is dip molded to the ultrasonic probe.

17. The device of claim 1 wherein the flexible material is injection molded to the ultrasonic probe.

18. The device of claim 1 wherein the flexible material is engaged to the ultrasonic probe at an ultrasonic probe tip.

19. The device of claim 1 wherein the flexible material extends beyond an ultrasonic probe tip.

20. The device of claim 1 wherein the flexible material surrounds the ultrasonic probe from the proximal end of the probe to the distal end of the probe.

21. The device of claim 1 wherein the flexible material surrounds substantially the entire longitudinal axis of the ultrasonic probe.

22. An ultrasonic medical device for removing a biological material comprising:

an elongated ultrasonic probe having a proximal end, a distal end and a longitudinal axis therebetween; and

a flexible material engaging the ultrasonic probe,

wherein the flexible material comprises a material of high radiopacity.

23. The device of claim 22 wherein the flexible material protects a vasculature as the elongated ultrasonic probe is moved through the vasculature.

24. The device of claim 22 wherein the flexible material cushions a tip of the elongated ultrasonic probe as the elongated ultrasonic probe is moved through a vasculature.

25. The device of claim 22 wherein the flexible material improves a trackability of the elongated ultrasonic probe through a vasculature.

26. The device of claim 22 wherein the flexible material reduces the stresses on the elongated ultrasonic probe as the elongated ultrasonic probe is navigated within a vasculature.

27. The device of claim 22 wherein the flexible material comprises a polymer material.

28. The device of claim 22 wherein the flexible material is shaped to increase a radial span of the elongated ultrasonic probe within a vasculature.

29. The device of claim 22 wherein the flexible material is engaged to the ultrasonic probe at an ultrasonic probe tip.

30. The device of claim 22 wherein the flexible material extends beyond an ultrasonic probe tip.

31. The device of claim 22 wherein the flexible material surrounds the ultrasonic probe from the proximal end of the probe to the distal end of the probe.

32. The device of claim 22 wherein the flexible material surrounds substantially the entire longitudinal axis of the ultrasonic probe.

33. A method of moving an ultrasonic probe along a path in a vasculature of a body to remove a biological material comprising:

engaging a flexible material to the ultrasonic probe;

inserting the ultrasonic probe with the flexible material into the vasculature;

advancing the ultrasonic probe in the vasculature until the flexible material contacts a wall of the vasculature to allow the ultrasonic probe to bend along the path in the vasculature; and

moving the ultrasonic probe further along the vasculature.

34. The method of claim 33 wherein the flexible material surrounds at least a portion of a longitudinal axis of the ultrasonic probe.

35. The method of claim 33 wherein the flexible material extends from a distal end of the ultrasonic probe.

36. The method of claim 33 further comprising melt forming the flexible material to the ultrasonic probe.

37. The method of claim 33 further comprising shrink fitting the flexible material to the ultrasonic probe.

38. The method of claim 33 further comprising dip molding the flexible material to the ultrasonic probe.

39. The method of claim 33 further comprising injection molding the flexible material to the ultrasonic probe.

40. The method of claim 33 further comprising engaging the flexible material to the ultrasonic probe with an adhesive.

41. The method of claim 33 wherein the flexible material reduces the stresses on the ultrasonic probe as the ultrasonic probe is moved along the tortuous path in the vasculature.

42. The method of claim 33 wherein the flexible material comprises a material of high radiopacity.

43. The method of claim 33 wherein the flexible material is shaped to facilitate navigation within the vasculature.

44. The method of claim 33 further comprising shaping the flexible material to increase a radial span of the ultrasonic medical device within the vasculature.

45. The method of claim 33 wherein the flexible material protects the vasculature as the ultrasonic probe is moved through the vasculature.

46. The method of claim 33 wherein the flexible material cushions a tip of the ultrasonic probe as the ultrasonic probe is moved through the vasculature.

47. The method of claim 33 further comprising energizing the ultrasonic probe to remove the biological material in the vasculature.

48. A method of moving an ultrasonic probe along a path in a vasculature of a body to ablate a biological material comprising:

engaging a flexible material having a high radiopacity to the ultrasonic probe;

inserting the ultrasonic probe with the flexible material into a vasculature;

advancing the ultrasonic probe within the vasculature; and

activating an ultrasonic energy source to provide an ultrasonic energy to the ultrasonic probe to ablate the biological material.

49. The method of claim 48 further comprising shaping the flexible material to increase a radial span of the ultrasonic probe within the vasculature.

50. The method of claim 48 wherein the flexible material cushions a tip of the ultrasonic probe to protect the vasculature when moving the ultrasonic probe through the vasculature.

51. The method of claim 48 wherein the flexible material protects the vasculature as the ultrasonic probe is moved through the vasculature.

52. The method of claim 54 wherein the flexible material reduces the stresses on the ultrasonic probe as the ultrasonic probe is navigated within the vasculature.

53. A method for adhering a flexible material to an ultrasonic medical device comprising:

providing the flexible material to be adhered to the ultrasonic medical device;

engaging the flexible material to the ultrasonic medical device;

heating the flexible material engaged to the ultrasonic medical device with a heat source causing the flexible material to melt; and

cooling the flexible material engaged to the ultrasonic medical device to adhere the flexible material to the ultrasonic medical device.

54. The method of claim 53 wherein the flexible material is a polymer.

55. The method of claim 53 wherein the flexible material comprises a high radiopacity.

56. The method of claim 53 further comprising pre-extruding the flexible material to a desired shape and size.

57. The method of claim 53 wherein the flexible material has a hollow channel through the flexible material.

58. The method of claim 53 wherein the flexible material is a solid material.

59. The method of claim 53 further comprising melting the flexible material before engaging the flexible material to the ultrasonic medical device.

60. The method of claim 53 wherein the ultrasonic medical device is an ultrasonic probe.

61. The method of claim 60 wherein the ultrasonic probe comprises titanium.

62. The method of claim 53 wherein the heat source is an oven.

63. The method of claim 53 wherein the heat source is a hot air system.

64. The method of claim 53 wherein the heat source is a heating block.

65. The method of claim 53 further comprising heat shrinking a polymer over the flexible material engaged to the ultrasonic medical device.

66. The method of claim 53 further comprising applying a heat shrink in an expanded state over the flexible material engaging the ultrasonic medical device prior to melting the flexible material.

67. The method of claim 53 further comprising placing the flexible material and the ultrasonic medical device in a mold.